UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

AIRE TECHNOLOGY LTD., Plaintiff, v. APPLE INC., Defendant.	Case No. 6:21-cv-01101 **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT AGAINST APPLE INC.

This is an action for patent infringement arising under the Patent Laws of the United States of America, 35 U.S.C. § 1 *et seq.*, in which Plaintiff Aire Technology Limited ("Plaintiff" or "Aire") makes the following allegations against Defendant Apple Inc. ("Defendant" or "Apple"):

INTRODUCTION

1. This complaint arises from Apple's unlawful infringement of the following United States patents owned by Plaintiff, which relate to improvements in Near Field Communication (NFC) and secure digital payment solutions: United States Patent Nos. 8,581,706 ("the '706 Patent"), 8,205,249 ("the '249 Patent"), and 8,174,360 ("the '360 Patent") (collectively, the "Asserted Patents").

PARTIES

2. Plaintiff Aire Technology Limited is a limited liability company organized and existing under the law of Ireland, with its principal place of business at The Hyde Building, Suite 23, The Park, Carrickmines, Dublin 18, Ireland. Aire is the sole owner by assignment of all rights,

title, and interest in the Asserted Patents, including the right to recover damages for past, present, and future infringement.

3. On information and belief, Defendant Apple Inc. is a publicly traded corporation organized under the laws of the State of California, with its principal place of business at One Apple Park Way, Cupertino, CA 95014. Apple may be served with process through its registered agent, CT Corporation System, at 330 North Brand Boulevard, Suite 700, Glendale, CA 91203.

JURISDICTION AND VENUE

4. This action arises under the patent laws of the United States, Title 35 of the United States Code. This Court has original subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

5. This Court has personal jurisdiction over Apple in this action because Apple has committed acts within this District giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Apple would not offend traditional notions of fair play and substantial justice. Apple, directly and through subsidiaries or intermediaries, has committed and continues to commit acts of infringement in this District by, among other things, importing, offering to sell, and selling products that infringe the Asserted Patents.

6. Venue is proper in this District under 28 U.S.C. §§ 1391 and 1400(b). Apple is registered to do business in Texas, and upon information and belief, Apple has transacted business in this District and has committed acts of direct and indirect infringement in this District by, among other things, making, using, offering to sell, selling, and importing products that infringe the Asserted Patents. Apple has regular and established places of business in this District, including at 12545 Riata Vista Cir., Austin, Texas 78727; 12801 Delcour Dr., Austin, Texas 78727; and

3121 Palm Way, Austin, Texas 78758.[1] Apple also has posted job listings for engineer positions related to NFC and/or Apple Pay in Austin, Texas, which is a job that concerns the implementation of the inventions contained in the Asserted Patents.[2]

THE ASSERTED PATENTS

7. On November 12, 2013, the United States Patent and Trademark Office issued U.S. Patent No. 8,581,706 ("the '706 Patent"), entitled "Data storage medium and method for contactless communication between the data storage medium and a reader," after full and fair examination. Plaintiff is the assignee of all rights, title, and interest in and to the '706 Patent and possesses all rights of recovery under the '706 Patent, including the right to recover damages for past, present, and future infringement. The '706 Patent is valid and enforceable. A true and correct copy of the '706 Patent is attached hereto as Exhibit 1.

8. On June 19, 2012, the United States Patent and Trademark Office issued U.S. Patent No. 8,205,249 ("the '249 Patent"), entitled "Method for carrying out a secure electronic transaction using a portable data support," after full and fair examination. Plaintiff is the assignee of all rights, title, and interest in and to the '249 Patent and possesses all rights of recovery under the '249 Patent, including the right to recover damages for past, present, and future infringement. The '249 Patent is valid and enforceable. A true and correct copy of the '249 Patent is attached hereto as Exhibit 2.

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[1] *See, e.g.*, https://www.apple.com/newsroom/2019/11/apple-expands-in-austin/; https://www.google.com/maps/place/Apple+Inc./@30.4324406,-97.7359733,15z/data=!4m5!3m4!1s0x0:0x5852421ec4ac410c!8m2!3d30.4322558!4d-97.7359386; https://www.apple.com/retail/domainnorthside/.

[2] *See, e.g.*, https://jobs.apple.com/en-us/details/200292503/nfc-uwb-field-design-engineer?team=HRDWR; https://jobs.apple.com/en-us/details/200299202/software-engineer-apple-pay?team=SFTWR.

9. On May 8, 2012, the United States Patent and Trademark Office issued U.S. Patent No. 8,174,360 ("the '360 Patent"), entitled "Communication apparatus for setting up a data connection between intelligent devices," after full and fair examination. Plaintiff is the assignee of all rights, title, and interest in and to the '360 Patent and possesses all rights of recovery under the '360 Patent, including the right to recover damages for past, present, and future infringement. The '360 Patent is valid and enforceable. A true and correct copy of the '360 Patent is attached hereto as Exhibit 3.

APPLE'S INFRINGEMENT

10. The allegations provided below are exemplary and without prejudice to Plaintiff's infringement contentions provided pursuant to the Court's scheduling order and local rules. Plaintiff's claim construction contentions regarding the meaning and scope of the claim terms will be provided under the Court's scheduling order and local rules. As detailed below, each element of at least one claim of each of the Asserted Patents is literally present in the accused products. To the extent that any element is not literally present, each such element is present under the doctrine of equivalents. Plaintiff's analysis below should not be taken as an admission that the preamble is limiting. While publicly available information is cited below, Plaintiff may rely on other forms of evidence to prove infringement, including evidence that is solely in the possession of Apple and/or third parties.

11. The accused products include at least the following products, as well as products with reasonably similar functionality, including all Plus and Max sub-models. Identification of the accused products will be provided in Plaintiff's infringement contentions pursuant to the Court's scheduling order and local rules. Apple imports, uses, makes, offers for sale, and sells in the United States the following products that support NFC and/or mobile payment applications,

such as Apple Pay, that infringe at least one claim of the Asserted Patents: iPhone 6, 6 Plus, 6S, 6S Plus, SE (first and second generation), 7, 7 Plus, 8, 8 Plus, X, XR, XS, XS Max, 11, 11 Pro, 11 Pro Max, 12, 12 mini, 12 Pro, 12 Pro Max, 13, 13 mini, 13 Pro, 13 Pro Max, Watch Series 1, Watch Series 2, Watch Series 3, Watch Series 4, Watch Series 5, Watch SE, Watch Series 6, and Watch Series 7 (the "Accused Products"). *See* https://support.apple.com/en-us/HT208531.

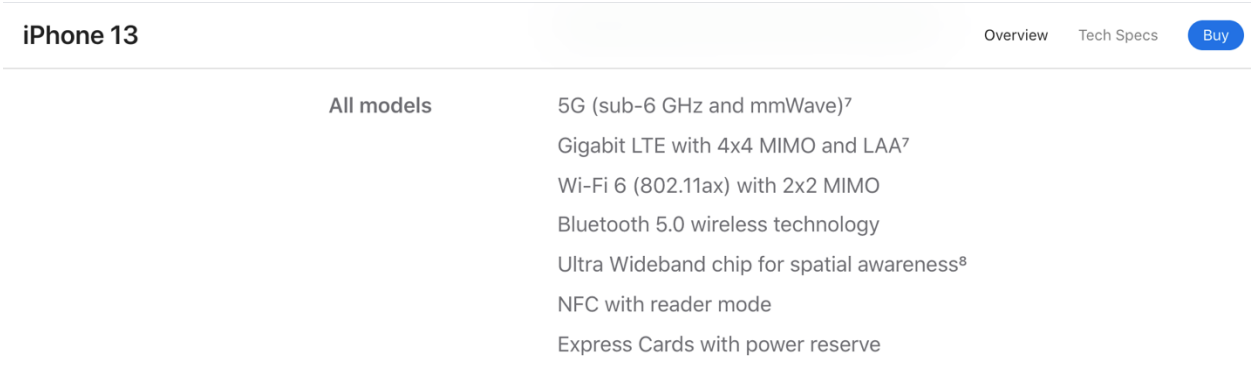
COUNT I

INFRINGEMENT OF U.S. PATENT NO. 8,581,706

12. Plaintiff realleges and incorporates by reference the foregoing paragraphs as if fully set forth herein.

13. Apple has been and is now directly infringing the '706 Patent, literally and/or under the doctrine of equivalents, in violation of 35 U.S.C. § 271(a), including by making, using, selling, and/or offering for sale in the United States or importing into the United States infringing products, including at least the Accused Products identified above. The Accused Products satisfy all of the claim limitations of one or more claims of the '706 Patent, including but not limited to claim 11.

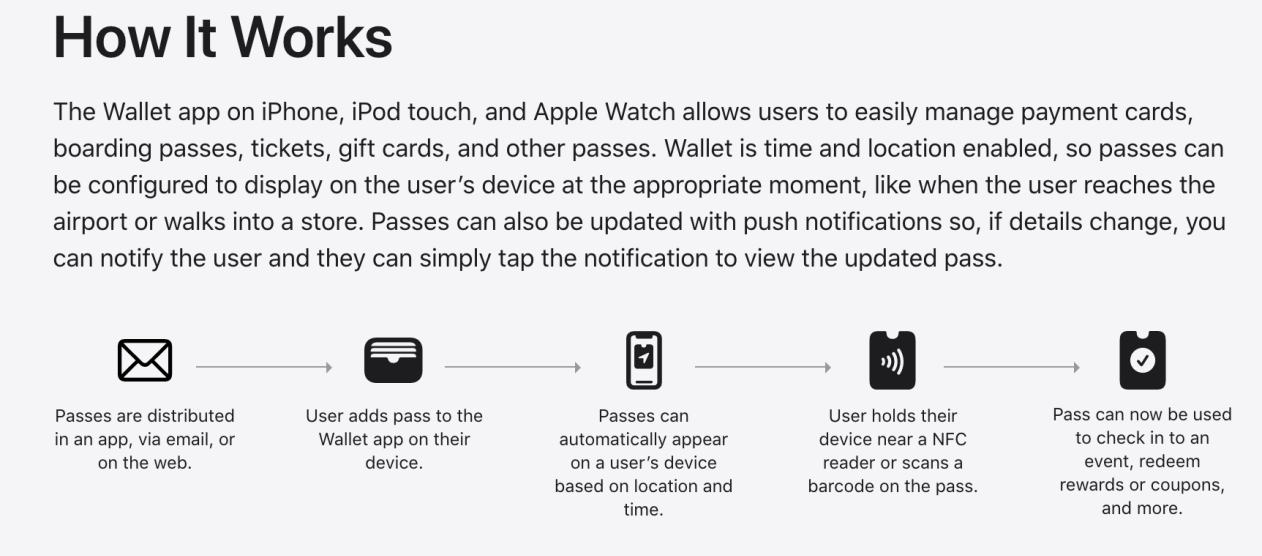
14. Claim 11 of the '706 Patent recites a "contactlessly communicating portable data carrier." To the extent the preamble is limiting, the Accused Products each include a portable data carrier that is capable of contactless communication through the use of Near Field Communication (NFC) technology. For example, Apple advertises that the Accused Products support NFC:



See https://www.apple.com/iphone-13/specs/.

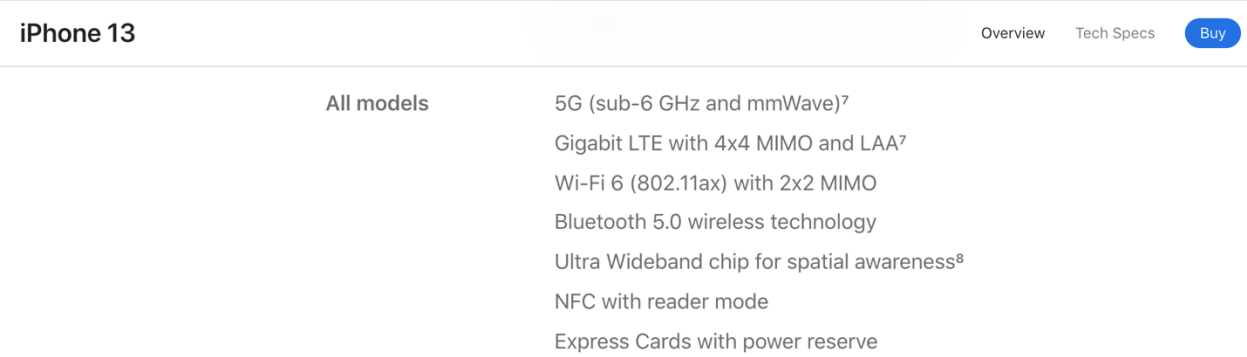
15. Claim 11 of the '706 Patent recites that the portable data carrier comprises "at least two applications stored thereon." The Accused Products are configured to store at least two applications. For example, the Accused Products are configured to store at least two applications that utilize NFC:

See https://www.apple.com/wallet/.



See https://developer.apple.com/wallet/get-started/.

16. Claim 11 of the '706 Patent recites that the portable data carrier comprises "a communication device configured to control communication between a reading device and the at least two applications." The Accused Products contain a communication device configured to control communication between a reading device and at least two applications. For example, the Accused Products utilize an NFC antenna, NFC chip, and related hardware and software to control communication with a reading device and at least two applications, as shown in the exemplary iPhone 13:



See https://www.apple.com/iphone-13/specs/.

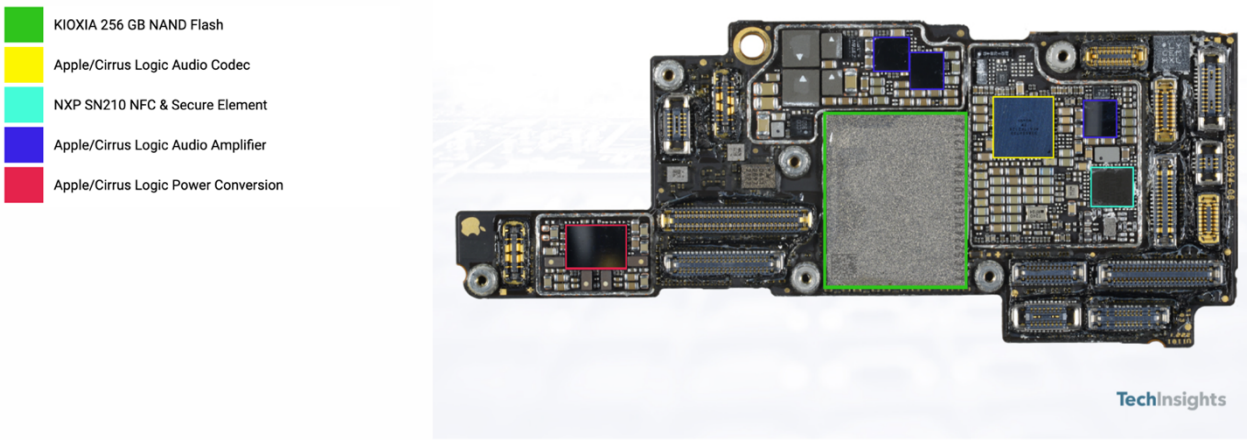


Figure 2. Apple iPhone Pro Board Shot

See https://www.techinsights.com/blog/teardown/apple-iphone-13-pro-teardown; *see also* https://www.ifixit.com/Teardown/iPhone+13+Pro+Teardown/144928 (identifying NXP SN210V NFC controller with secure element).

17. Claim 11 of the '706 Patent recites "wherein the communication device is set up to generate communication-readiness signals to the reading device which in each case indicate to the reading device a communication readiness for one of the applications and comprise an identification number assigned to the corresponding communication-readiness application." The Accused Products contain a communication device that is set up to generate communication-readiness signals to the reading device which in each case indicate to the reading device a communication readiness for one of the applications and comprise an identification number assigned to the corresponding communication-readiness application. For example, the communication device generates communication-readiness signals to an NFC reader which comprise an identification number that corresponds to an application:

How to pay using Apple Pay in stores and other places

With your iPhone or Apple Watch, you can use Apple Pay in stores, restaurants, gas stations, taxis, or wherever else you see one of these symbols[1].

Pay with your iPhone

1. To use your default payment card:
   - If your iPhone has Face ID, double-click the side button. Authenticate with Face ID or enter your passcode.
   - If your iPhone has Touch ID, rest your finger on the Touch ID sensor.
2. To use a different card, tap your default card to see your other cards. Tap a new card and authenticate.
3. Hold the top of your iPhone near the contactless reader until you see Done and a checkmark on the display.

Pay with your Apple Watch

1. Double-click the side button.
2. Your default card opens automatically. Scroll down to choose another card.
3. Hold the display of your Apple Watch near the contactless reader until you feel a gentle tap and hear a beep.

See https://support.apple.com/en-us/HT201239.

Pay for your ride with Express Transit

To use Express Transit, your iPhone or Apple Watch must be turned on, but they don't have to be connected to a network.[2]

Use Express Transit on your iPhone

1. Hold the top of your iPhone near the middle of the contactless reader.
2. Wait until you feel a vibration.
3. You see Done and a checkmark on the display.

Use Express Transit on your Apple Watch

1. Hold the display of your Apple Watch near the middle of the contactless reader.
2. Wait until you feel a vibration.
3. You see Done and a checkmark on the display.

See https://support.apple.com/en-us/HT209495.

Unlock or start your car with your Apple device

To unlock your car, hold your iPhone or Apple Watch near the car's door handle.

To start your car, place your iPhone in the car's key reader, or hold your Apple Watch near the reader. Then press the car's start button.

Use Express Mode to quickly unlock or start your car

Express Mode is turned on by default when you add a car key to the Wallet app. It lets you automatically unlock your car door and allows you to quickly start the vehicle. If you leave your car, hold your Apple device near the door handle to lock it.

To turn off Express Mode:

1. Open the Wallet app on your iPhone.
2. Tap the card for your car key.
3. Tap the More button .
4. Turn off Express Mode.

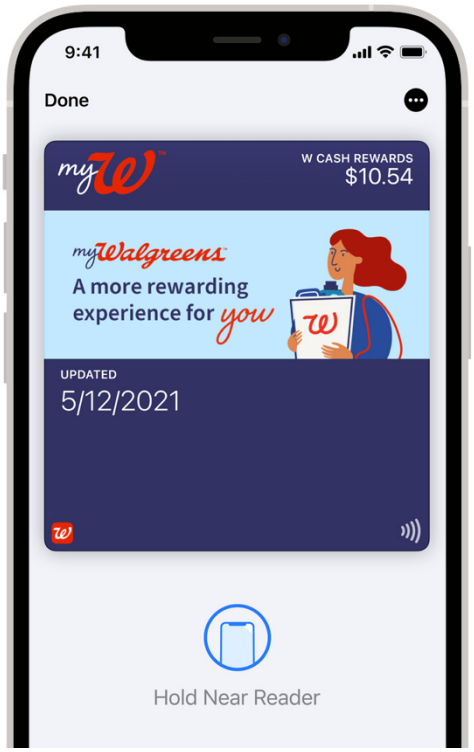
If you turn off Express Mode, you must authenticate each time you use your Apple device as a car key:

- On your iPhone, open the Wallet app and tap the card for your car key. Hold your iPhone near the car's door handle or key reader, then use your passcode, Face ID, or Touch ID to proceed.
- On your Apple Watch, double-click the side button to access your cards. Tap the card for your car key, then hold your watch near the car's door handle or key reader.

See https://support.apple.com/en-us/HT211234.

Loyalty and Rewards

Add your favorite coffee shop, drugstore, or retail rewards cards to Wallet, and next time you're at checkout, just tap and pay to receive and redeem rewards.[8] Never lose another card, another point, or another free double latte again. It's the perfect way to get all your points across.



See https://www.apple.com/wallet/.

Student ID

Add your student ID card to Wallet and never worry about losing it again.[6] Use your iPhone or Apple Watch anywhere your ID is accepted — both on and off campus. Just hold your device to the reader and get into places like your dorm, the library, and school events. Pay for laundry, snacks, and dinners nearby, too. It's your pass, no fail.

See https://www.apple.com/wallet/.

18. Claim 11 of the '706 Patent recites "wherein the communication device is set up to store information in a nonvolatile memory of the data carrier about which of the at least two applications last communicated with a reading device." Each of the Accused Products contains a

communication device that is set up to store information in a nonvolatile memory of the data carrier about which of the at least two applications last communicated with a reading device. For example, the Accused Products provide information about the last application that communicated with a reading device:

See your Apple Pay transaction history

Check the latest transactions for the cards that you use with Apple Pay, directly on the device that you used to make the purchases.

Depending on your bank or card issuer, you might see only transactions made on the device that you're using. Or you might see any transactions made from your credit or debit card account, including from all devices that you use with Apple Pay and your physical card.

See https://support.apple.com/en-us/HT212786.

See your Apple Card spending history

See transactions, see your balance, and track how much you spend on entertainment, food, shopping, and more.

See recent purchases

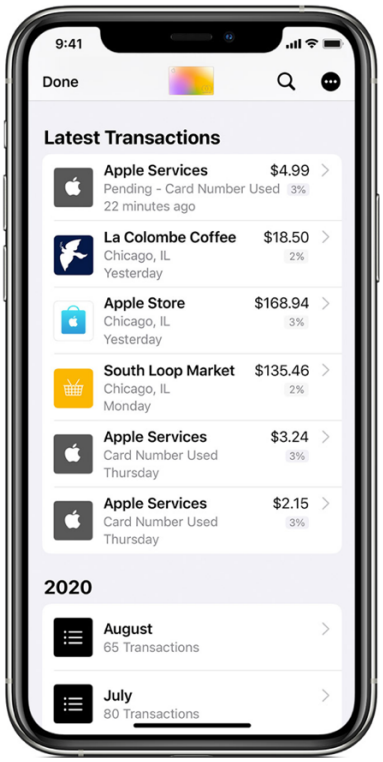
1. On your iPhone, open the Wallet app. If you use Apple Card Family, you can see who made the purchase.
2. Tap Apple Card, then tap a transaction under Latest Transactions. To see older transactions, scroll down and tap a month, then tap a transaction.
3. Tap the transaction again to see details.

If you don't recognize a purchase, you can dispute a charge.

Find a transaction

1. On your iPhone, open the Wallet app.
2. Tap Apple Card.
3. Tap the search icon.

You can search by category, merchant, location, date, or transaction amount. If you use Apple Card Family, you can also see who made the purchase. To explore your spending on your account over time, tap the Daily/Weekly/Yearly card.



See https://support.apple.com/en-us/HT209489.

19. Apple also knowingly and intentionally induces infringement of one or more claims of the '706 Patent in violation of 35 U.S.C. § 271(b). As of at least the filing and service of this complaint, Apple has knowledge of the '706 Patent and the infringing nature of the Accused Products. Despite this knowledge of the '706 Patent, Apple continues to actively encourage and instruct its customers and end users (for example, through user manuals and online instruction materials on its website, and other online publications cited above) to use the Accused Products in ways that directly infringe the '706 Patent, for example by utilizing the NFC functionality on the Accused Products and/or mobile payment applications, such as Apple Pay, in an infringing manner. Apple does so knowing and intending (or with willful blindness to the fact) that its customers and end users will commit these infringing acts. Apple also continues to make, use, offer for sale, sell, and/or import the Accused Products, despite its knowledge of the '706 Patent, thereby specifically intending for and inducing its customers to infringe the '706 Patent through the customers' normal and customary use of the Accused Products.

20. Apple has also infringed, and continues to infringe, one or more claims of the '706 Patent by selling, offering for sale, or importing into the United States, the Accused Products, knowing that the Accused Products constitute a material part of the inventions claimed in the '706 Patent, are especially made or adapted to infringe the '706 Patent, and are not staple articles or commodities of commerce suitable for non-infringing use. Apple has been, and currently is, contributorily infringing the '706 Patent in violation of 35 U.S.C. §§ 271(c) and/or (f).

21. By making, using, offering for sale, selling and/or importing into the United States the Accused Products, Apple has injured Plaintiff and is liable for infringement of the '706 Patent pursuant to 35 U.S.C. § 271.

22. As a result of Apple's infringement of the '706 Patent, Plaintiff is entitled to monetary damages (past, present, and future) in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple, together with interest and costs as fixed by the Court.

COUNT II

INFRINGEMENT OF U.S. PATENT NO. 8,205,249

23. Plaintiff realleges and incorporates by reference the foregoing paragraphs as if fully set forth herein.

24. Apple has been and is now directly infringing the '249 Patent, literally and/or under the doctrine of equivalents, in violation of 35 U.S.C. § 271(a), including by making, using, selling, and/or offering for sale in the United States or importing into the United States infringing products, including at least the Accused Products identified above. The Accused Products satisfy all of the claim limitations of one or more claims of the '249 Patent, including but not limited to claim 10.

25. Claim 10 recites a "portable data carrier for performing a security-operation within a secure electronic transaction." To the extent the preamble is limiting, the Accused Products include a portable data carrier for performing a security-operation within a secure electronic transaction. For example, the Accused Products support mobile payment applications, such as Apple Pay, which enable a security-operation within a secure electronic transaction:

How to pay using Apple Pay in stores and other places

With your iPhone or Apple Watch, you can use Apple Pay in stores, restaurants, gas stations, taxis, or wherever else you see one of these symbols[1].

Pay with your iPhone

1. To use your default payment card:
   - If your iPhone has Face ID, double-click the side button. Authenticate with Face ID or enter your passcode.
   - If your iPhone has Touch ID, rest your finger on the Touch ID sensor.
2. To use a different card, tap your default card to see your other cards. Tap a new card and authenticate.
3. Hold the top of your iPhone near the contactless reader until you see Done and a checkmark on the display.

Pay with your Apple Watch

1. Double-click the side button.
2. Your default card opens automatically. Scroll down to choose another card.
3. Hold the display of your Apple Watch near the contactless reader until you feel a gentle tap and hear a beep.

See https://support.apple.com/en-us/HT201239.

26. Claim 10 of the '249 Patent recites that the portable data carrier is "arranged to perform different quality user authentication methods." To the extent the preamble is limiting, the Accused Products include a portable data carrier that is arranged to perform different quality user authentication methods. For example, the Accused Products support mobile payment applications, such as Apple Pay, which utilize different quality user authentication methods:

How to add a card for Apple Pay on your iPhone

Add a new debit or credit card to the Wallet app, or add a card you previously used on a device associated with your Apple ID.

Add a new card on your iPhone

1. In the Wallet app, tap the Add button .
2. Tap Debit or Credit Card.
3. Tap Continue.
4. Follow the steps on the screen to add a new card. If prompted, choose your bank or card issuer from the list or find them using the search bar.
5. Verify your information with your bank or card issuer. They might ask you to provide additional information or to download an app before approving your card for use with Apple Pay.
6. If you have a paired Apple Watch, you have the option to also add the card to your watch.

See https://support.apple.com/en-us/HT204506.

When you use Apple Pay in stores

When you use Apple Pay in stores that accept contactless payments, Apple Pay uses Near Field Communication (NFC) technology between your device and the payment terminal. NFC is an industry-standard, contactless technology that's designed to work only across short distances. If your iPhone is on and detects an NFC field, it will present you with your default card. To send your payment information, you must authenticate using Face ID, Touch ID, or your passcode (except in Japan if you designate a Suica card for Express Transit). With Face ID or with Apple Watch, you must double-click the side button when the device is unlocked to activate your default card for payment.

After you authenticate your transaction, the Secure Element provides your Device Account Number and a transaction-specific dynamic security code to the store's point of sale terminal along with additional information needed to complete the transaction. Again, neither Apple nor your device sends your actual payment card number. Before they approve the payment, your bank, card issuer, or payment network can verify your payment information by checking the dynamic security code to make sure that it's unique and tied to your device.

See https://support.apple.com/en-us/HT203027.

Use Express Mode with cards, passes, and keys in Apple Wallet

With Express Mode, you can use cards, passes, and keys in the Wallet app with just a tap.

Use transit or payment cards, passes, your student ID, your car key, and more without waking or unlocking your device, or authenticating with Face ID, Touch ID, or your passcode. You might even be able to use your card, pass, or key when your device needs to be charged.

Multiple cards, passes, and keys with Express Mode can be active in the Wallet app at the same time. For example, you can have one student ID and one car key each set to Express Mode.

With some cards, passes, and keys, you can't have multiple of the same type or from the same issuer set to Express Mode. For example, you can only have one student ID from the same school set to Express Mode.

With some passes, you might be able to set multiple passes of the same type to Express Mode.

For transit, you can set one payment card and one transit card to Express Mode for each transit network.

See https://support.apple.com/en-us/HT212171.

27. Claim 10 recites "wherein the difference in quality of said user authentication methods varies between an inherently relatively lower quality and an inherently relatively higher quality from a security perspective." To the extent the preamble is limiting, the Accused Products include a data carrier arranged to perform different quality user authentication methods, wherein the difference in quality of said user authentication methods varies between an inherently relatively lower quality and an inherently relatively higher quality from a security perspective. For example, the Accused Products support mobile payment applications, such as Apple Pay, which utilize different authentication methods that vary in quality from a security perspective:

When you use Apple Pay in stores

When you use Apple Pay in stores that accept contactless payments, Apple Pay uses Near Field Communication (NFC) technology between your device and the payment terminal. NFC is an industry-standard, contactless technology that's designed to work only across short distances. If your iPhone is on and detects an NFC field, it will present you with your default card. To send your payment information, you must authenticate using Face ID, Touch ID, or your passcode (except in Japan if you designate a Suica card for Express Transit). With Face ID or with Apple Watch, you must double-click the side button when the device is unlocked to activate your default card for payment.

After you authenticate your transaction, the Secure Element provides your Device Account Number and a transaction-specific dynamic security code to the store's point of sale terminal along with additional information needed to complete the transaction. Again, neither Apple nor your device sends your actual payment card number. Before they approve the payment, your bank, card issuer, or payment network can verify your payment information by checking the dynamic security code to make sure that it's unique and tied to your device.

See https://support.apple.com/en-us/HT203027.

Use Express Mode with cards, passes, and keys in Apple Wallet

With Express Mode, you can use cards, passes, and keys in the Wallet app with just a tap.

Use transit or payment cards, passes, your student ID, your car key, and more without waking or unlocking your device, or authenticating with Face ID, Touch ID, or your passcode. You might even be able to use your card, pass, or key when your device needs to be charged.

Multiple cards, passes, and keys with Express Mode can be active in the Wallet app at the same time. For example, you can have one student ID and one car key each set to Express Mode.

With some cards, passes, and keys, you can't have multiple of the same type or from the same issuer set to Express Mode. For example, you can only have one student ID from the same school set to Express Mode.

With some passes, you might be able to set multiple passes of the same type to Express Mode.

For transit, you can set one payment card and one transit card to Express Mode for each transit network.

See https://support.apple.com/en-us/HT212171.

28. Claim 10 of the '249 Patent recites that "the portable data carrier is arranged to perform a user authentication using one of said implemented user authentication methods." The Accused Products include a portable data carrier arranged to perform a user authentication using one of said implemented user authentication methods. For example, the Accused Products support mobile payment applications, such as Apple Pay, which utilize different user authentication methods:

When you use Apple Pay in stores

When you use Apple Pay in stores that accept contactless payments, Apple Pay uses Near Field Communication (NFC) technology between your device and the payment terminal. NFC is an industry-standard, contactless technology that's designed to work only across short distances. If your iPhone is on and detects an NFC field, it will present you with your default card. To send your payment information, you must authenticate using Face ID, Touch ID, or your passcode (except in Japan if you designate a Suica card for Express Transit). With Face ID or with Apple Watch, you must double-click the side button when the device is unlocked to activate your default card for payment.

After you authenticate your transaction, the Secure Element provides your Device Account Number and a transaction-specific dynamic security code to the store's point of sale terminal along with additional information needed to complete the transaction. Again, neither Apple nor your device sends your actual payment card number. Before they approve the payment, your bank, card issuer, or payment network can verify your payment information by checking the dynamic security code to make sure that it's unique and tied to your device.

See https://support.apple.com/en-us/HT203027.

Use Express Mode with cards, passes, and keys in Apple Wallet

With Express Mode, you can use cards, passes, and keys in the Wallet app with just a tap.

Use transit or payment cards, passes, your student ID, your car key, and more without waking or unlocking your device, or authenticating with Face ID, Touch ID, or your passcode. You might even be able to use your card, pass, or key when your device needs to be charged.

Multiple cards, passes, and keys with Express Mode can be active in the Wallet app at the same time. For example, you can have one student ID and one car key each set to Express Mode.

With some cards, passes, and keys, you can't have multiple of the same type or from the same issuer set to Express Mode. For example, you can only have one student ID from the same school set to Express Mode.

With some passes, you might be able to set multiple passes of the same type to Express Mode.

For transit, you can set one payment card and one transit card to Express Mode for each transit network.

See https://support.apple.com/en-us/HT212171.

29. Claim 10 of the '249 Patent recites that "the portable data carrier is arranged to confirm the authentication to a terminal." The Accused Products include a portable data carrier arranged to confirm the authentication to a terminal. For example, the Accused Products support mobile payment applications, such as Apple Pay, and confirm the authentication to a terminal:

Secure Element

The Secure Element hosts a specially designed applet to manage Apple Pay. It also includes applets certified by payment networks or card issuers. Credit, debit, or prepaid card data is sent from the payment network or card issuer encrypted to these applets using keys that are known only to the payment network or card issuer and the applets' security domain. This data is stored within these applets and protected using the Secure Element's security features. During a transaction, the terminal communicates directly with the Secure Element through the near-field-communication (NFC) controller over a dedicated hardware bus.

See https://support.apple.com/guide/security/secure-element-and-nfc-controller-seccb53a35f0/web.

How to pay using Apple Pay in stores and other places

With your iPhone or Apple Watch, you can use Apple Pay in stores, restaurants, gas stations, taxis, or wherever else you see one of these symbols[1].

Pay with your iPhone

1. To use your default payment card:
   - If your iPhone has Face ID, double-click the side button. Authenticate with Face ID or enter your passcode.
   - If your iPhone has Touch ID, rest your finger on the Touch ID sensor.
2. To use a different card, tap your default card to see your other cards. Tap a new card and authenticate.
3. Hold the top of your iPhone near the contactless reader until you see Done and a checkmark on the display.

Pay with your Apple Watch

1. Double-click the side button.
2. Your default card opens automatically. Scroll down to choose another card.
3. Hold the display of your Apple Watch near the contactless reader until you feel a gentle tap and hear a beep.

See https://support.apple.com/en-us/HT201239.

Pay for your ride with Express Transit

To use Express Transit, your iPhone or Apple Watch must be turned on, but they don't have to be connected to a network.[2]

Use Express Transit on your iPhone

1. Hold the top of your iPhone near the middle of the contactless reader.
2. Wait until you feel a vibration.
3. You see Done and a checkmark on the display.

Use Express Transit on your Apple Watch

1. Hold the display of your Apple Watch near the middle of the contactless reader.
2. Wait until you feel a vibration.
3. You see Done and a checkmark on the display.

See https://support.apple.com/en-us/HT209495.

30. Claim 10 of the '249 Patent recites "wherein the data carrier is arranged to create quality information about said user authentication method used and to attach such quality information to the result of the security establishing operation." The Accused Products include a portable data carrier that is arranged to create quality information about the user authentication method used and to attach such quality information to the result of the security establishing operation. For example, on information and belief, the Accused Products include a data carrier that creates quality information about the type of authentication method used by a user and attach that information to the result of the security establishing operation in an electronic transaction.

What is Consumer Device Cardholder Verification Method?

Consumer Device Cardholder Verification Method (CDCVM) is a type of consumer verification method (CVM) supported by the card networks when assessing transactions originating from mobile devices. Verification is used to evaluate whether the person presenting the payment instrument is the legitimate owner of the instrument, and affects where the liability lies for fraudulent transactions.

With Apple Pay, Face ID, Touch ID, or the device passcode can be used as the consumer device verification method, instead of the more traditional methods of PIN, signature for transactions in stores, or 3D Secure for transactions within apps.

For Apple Pay contactless EMV transactions, CDCVM is performed and verified entirely on the iOS device or Apple Watch. During the transaction, no additional customer action is required on the payment terminal or paper receipt to verify the customer, such as a signature or PIN.

How does CDCVM work?

CDCVM verifies the customer of a payment transaction. For each EMV transaction, the payment terminal and the supporting payment network applications within the iOS device must mutually decide which customer verification method to use. To decide, the terminal and iOS device will compare the verification methods that they each support, and they'll use the first one that they both support.

For Apple Pay transactions, CDCVM acts in place of other methods of verification when it's supported by the payment terminal.

During the authorization request, the customer verification method is passed from the payment terminal to the issuer. The verification method is then used to determine fraud liability based on payment network policy. Learn more about liability.

See https://web.archive.org/web/20201108133245/https:/support.apple.com/en-us/HT202527.

Authorizing a secure transaction

When the user authorizes a transaction, which includes a physical gesture communicated directly to the Secure Enclave, the Secure Enclave then sends signed data about the type of authentication and details about the type of transaction (contactless or within apps) to the Secure Element, tied to an Authorization Random (AR) value. The AR value is generated in the Secure Enclave when a user first provisions a credit card and persists while Apple Pay is enabled, protected by the Secure Enclave encryption and anti-rollback mechanism. It's securely delivered to the Secure Element by leveraging the pairing key. On receipt of a new AR value, the Secure Element marks any previously added cards as deleted.

Using a payment cryptogram for dynamic security

Payment transactions originating from the payment applets include a payment cryptogram along with a Device Account Number. This cryptogram, a one-time code, is computed using a transaction counter and a key. The transaction counter is incremented for each new transaction. The key is provisioned in the payment applet during personalization and is known by the payment network and/or the card issuer. Depending on the payment scheme, other data may also be used in the calculation, including:

- A Terminal Unpredictable Number, for near-field-communication (NFC) transactions
- An Apple Pay server nonce, for transactions within apps

These security codes are provided to the payment network and to the card issuer, which allows the issuer to verify each transaction. The length of these security codes may vary based on the type of transaction.

See https://support.apple.com/guide/security/payment-authorization-with-apple-pay-secc1f57e189/1/web/1.

Paying with cards in stores

If iPhone or Apple Watch is on and detects an NFC field, it presents the user with the requested card (if automatic selection is turned on for that card) or the default card, which is managed in Settings. The user can also go to the Wallet app and choose a card, or when the device is locked, can:

- Double-click the Home button on devices with Touch ID
- Double-click the side button on devices with Face ID

Next, before information is transmitted, the user must authenticate using Touch ID, Face ID, or their passcode. When Apple Watch is unlocked, double-clicking the side button activates the default card for payment. No payment information is sent without user authentication.

After the user authenticates, the Device Account Number and a transaction-specific dynamic security code are used when processing the payment. Neither Apple nor a user's device sends the full actual credit or debit card numbers to merchants. Apple may receive anonymous transaction information such as the approximate time and location of the transaction, which helps improve Apple Pay and other Apple products and services.

See https://support.apple.com/guide/security/paying-with-cards-using-apple-pay-secfbd5c0e54/1/web/1.

Transit cards

In many global markets, users can add supported transit cards to the Wallet app on supported models of iPhone and Apple Watch. Depending on the transit operator, this may be done by transferring the value and commuter pass from a physical card into its digital Apple Wallet representation or by provisioning a new transit card into the Wallet app from the Wallet app or the transit card issuer's app. After transit cards are added to the Wallet app, users can ride transit simply by holding their iPhone or Apple Watch near the transit reader. Some cards can also be used to make payments.

See https://support.apple.com/guide/security/adding-transit-and-student-id-cards-to-wallet-seccba2be6de/1/web/1.

31. Apple also knowingly and intentionally induces infringement of one or more claims of the '249 Patent in violation of 35 U.S.C. § 271(b). As of at least the filing and service of this complaint, Apple has knowledge of the '249 Patent and the infringing nature of the Accused Products. Despite this knowledge of the '249 Patent, Apple continues to actively encourage and instruct its customers and end users (for example, through user manuals and online instruction

materials on its website, and other online publications cited above) to use the Accused Products in ways that directly infringe the '249 Patent, for example by utilizing the NFC functionality on the Accused Products and/or mobile payment applications, such as Apple Pay, in an infringing manner. Apple does so knowing and intending (or with willful blindness to the fact) that its customers and end users will commit these infringing acts. Apple also continues to make, use, offer for sale, sell, and/or import the Accused Products, despite its knowledge of the '249 Patent, thereby specifically intending for and inducing its customers to infringe the '249 Patent through the customers' normal and customary use of the Accused Products.

32. Apple has also infringed, and continues to infringe, one or more claims of the '249 Patent by selling, offering for sale, or importing into the United States, the Accused Products, knowing that the Accused Products constitute a material part of the inventions claimed in the '249 Patent, are especially made or adapted to infringe the '249 Patent, and are not staple articles or commodities of commerce suitable for non-infringing use. Apple has been, and currently is, contributorily infringing the '249 Patent in violation of 35 U.S.C. §§ 271(c) and/or (f).

33. By making, using, offering for sale, selling and/or importing into the United States the Accused Products, Apple has injured Plaintiff and is liable for infringement of the '249 Patent pursuant to 35 U.S.C. § 271.

34. As a result of Apple's infringement of the '249 Patent, Plaintiff is entitled to monetary damages (past, present, and future) in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple, together with interest and costs as fixed by the Court.

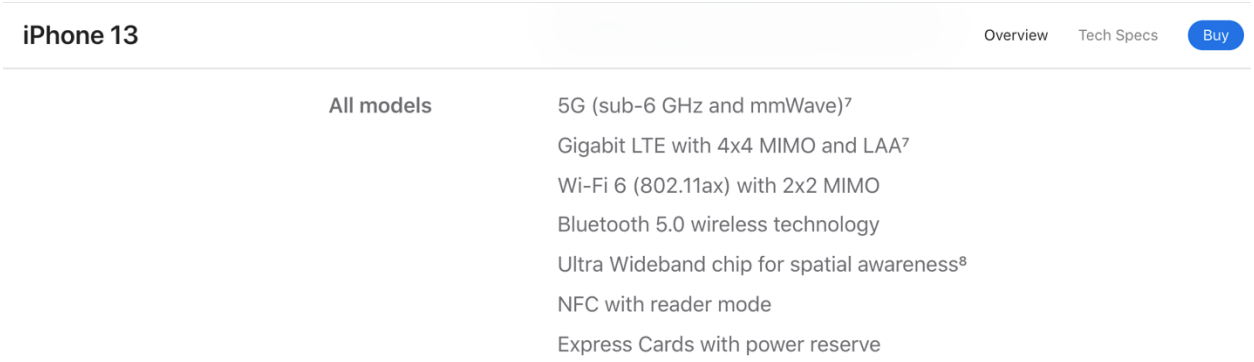
COUNT III

INFRINGEMENT OF U.S. PATENT NO. 8,174,360

35. Plaintiff realleges and incorporates by reference the foregoing paragraphs as if fully set forth herein.

36. Apple has been and is now directly infringing the '360 Patent, literally and/or under the doctrine of equivalents, in violation of 35 U.S.C. § 271, including by making, using, selling, and/or offering for sale in the United States or importing into the United States infringing products, including at least the Accused Products identified above. The Accused Products satisfy all of the claim limitations of one or more claims of the '360 Patent, including but not limited to claim 1.

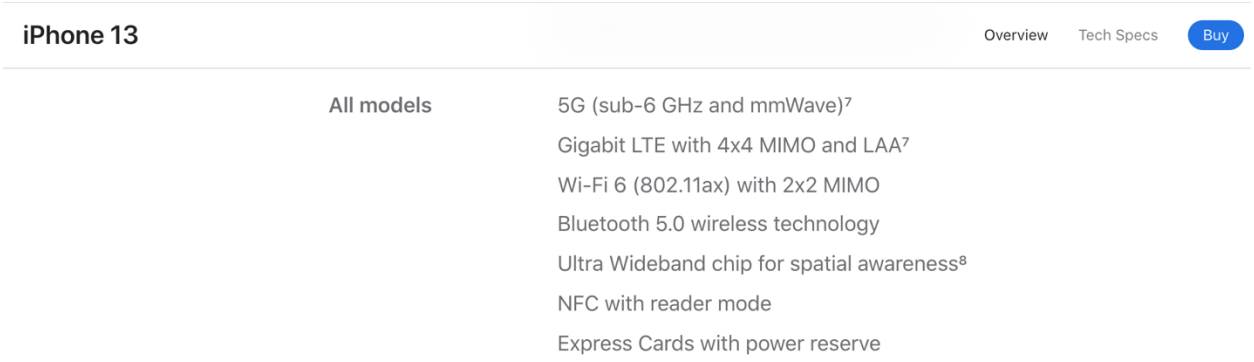
37. Claim 1 of the '360 Patent recites a "communication apparatus for setting up a data connection between intelligent devices." To the extent the preamble is limiting, the Accused Products include a communication apparatus for setting up a data connection between intelligent devices. For example, Apple advertises that the Accused Products support NFC:



See https://www.apple.com/iphone-13/specs/.

38. Claim 1 of the '360 Patent recites an "apparatus" comprising "a transmission oscillator for carrying out a contactless data exchange, said oscillator including a coil." The Accused Products include a transmission oscillator for carrying out a contactless data exchange,

said oscillator including a coil. For example, the Accused Products include an NFC antenna, NFC chip, and related hardware and software, as shown in the exemplary Apple iPhone 13:



See https://www.apple.com/iphone-13/specs/.

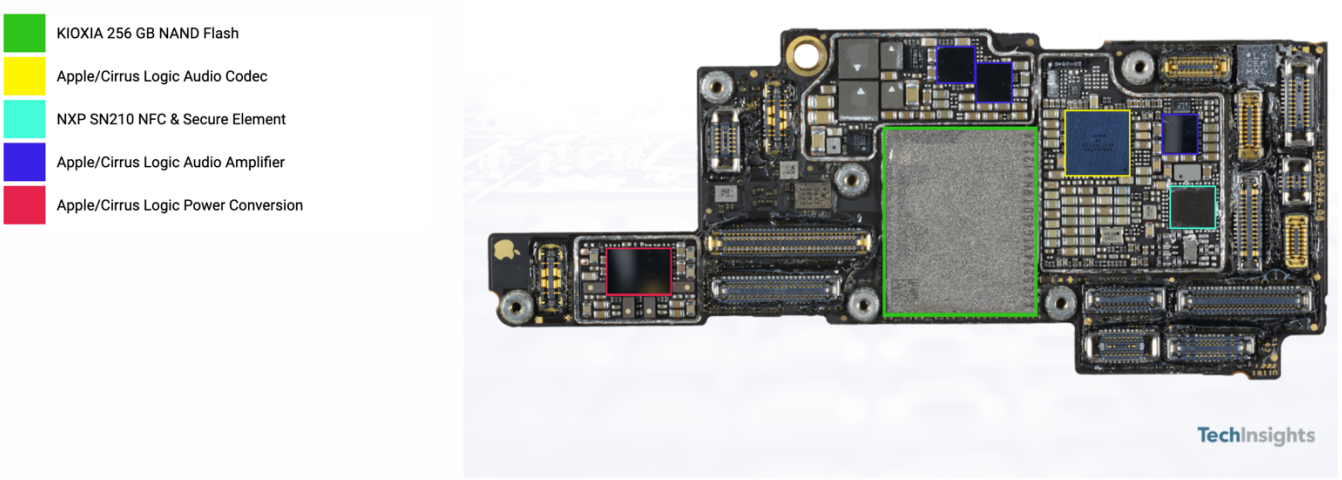


Figure 2. Apple iPhone Pro Board Shot

See https://www.techinsights.com/blog/teardown/apple-iphone-13-pro-teardown; *see also* https://www.ifixit.com/Teardown/iPhone+13+Pro+Teardown/144928 (identifying NXP SN210V NFC controller with secure element).

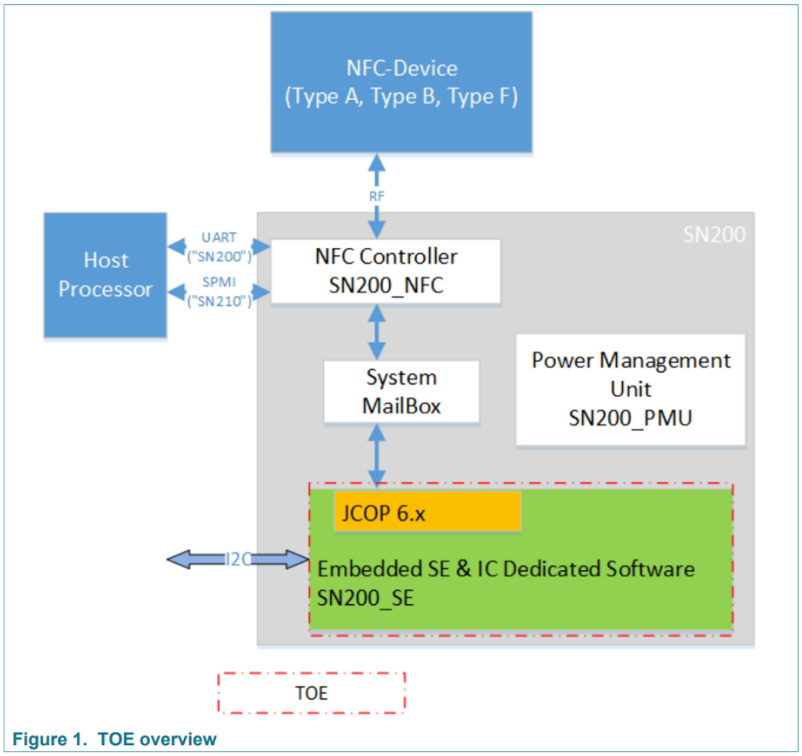
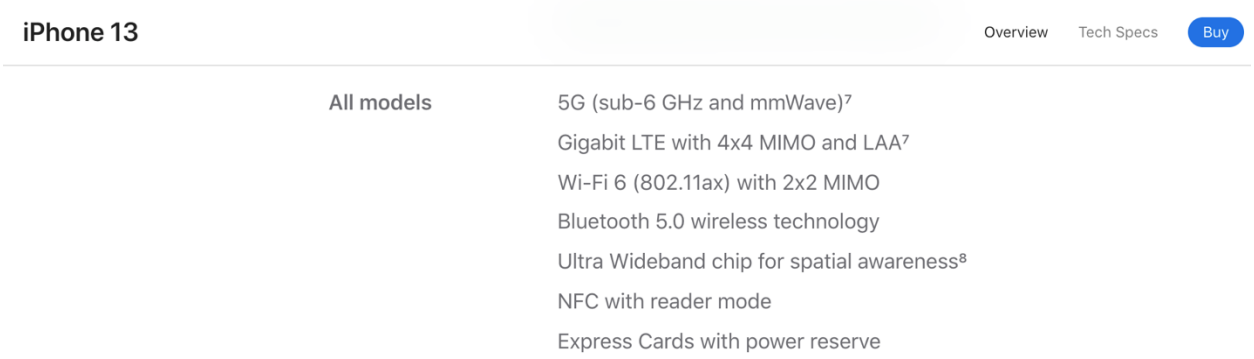


Figure 1. TOE overview

See https://www.commoncriteriaportal.org/files/epfiles/nscib-cc-235773_2-st-lite.pdf.

39. Claim 1 of the '360 Patent recites an "apparatus" comprising "a communication element which is connected to the coil and to a data processing component of an intelligent device and which emits search signals via the coil to receive a response from another intelligent device." The Accused Products include a communication element which is connected to the coil and to a data processing component of an intelligent device and which emits search signals via the coil to receive a response from another intelligent device. For example, teardowns show that the Accused Products include an NFC antenna, NFC chip, and related hardware and software, as shown in the exemplary Apple iPhone 13:



See https://www.apple.com/iphone-13/specs/.

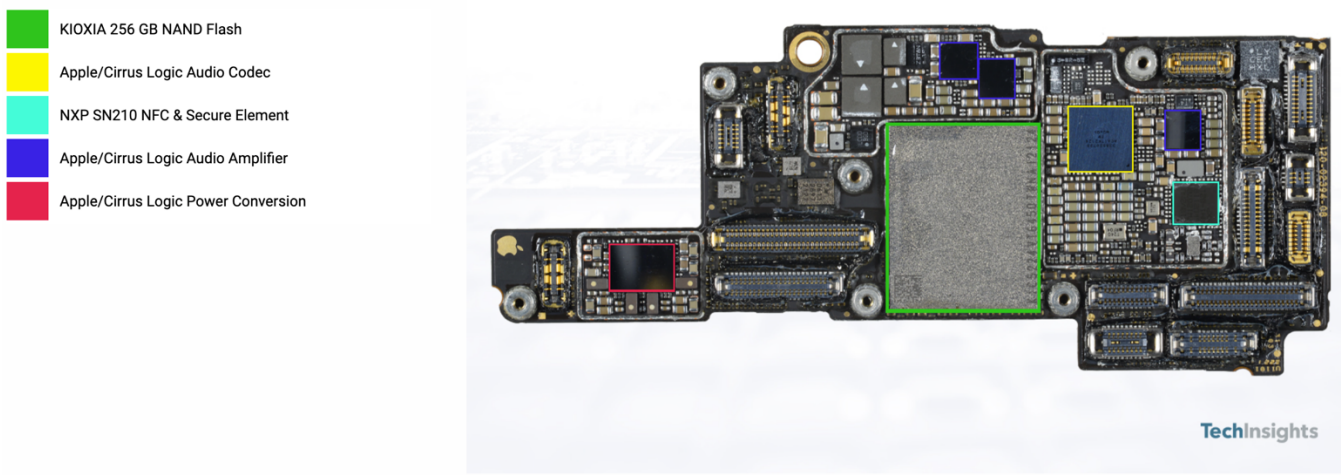


Figure 2. Apple iPhone Pro Board Shot

See https://www.techinsights.com/blog/teardown/apple-iphone-13-pro-teardown; *see also* https://www.ifixit.com/Teardown/iPhone+13+Pro+Teardown/144928 (identifying NXP SN210V NFC controller with secure element).

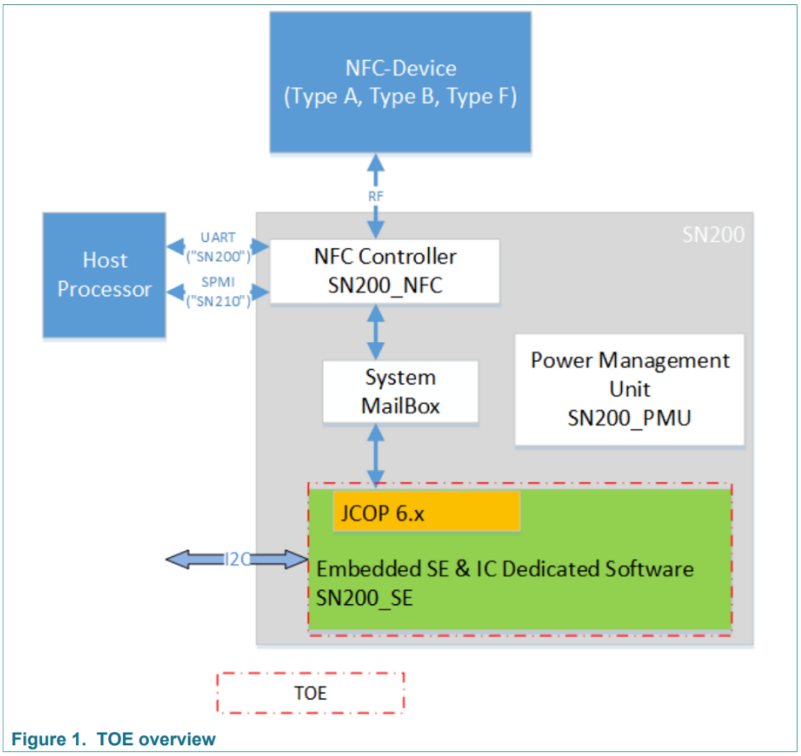


Figure 1. TOE overview

See https://www.commoncriteriaportal.org/files/epfiles/nscib-cc-235773_2-st-lite.pdf.

40. Claim 1 of the '360 Patent recites an "apparatus" comprising "a measuring device for monitoring a property of the transmission oscillator which outputs a control signal when ascertaining a change of the monitored property, the monitored property of the transmission oscillator includes the frequency or impedance of the transmission oscillator in resonance." The Accused Products include a measuring device for monitoring a property of the transmission oscillator which outputs a control signal when ascertaining a change of the monitored property, the monitored property of the transmission oscillator includes the frequency or impedance of the transmission oscillator in resonance. For example, on information and belief, the Accused Products include low power modes for the NFC functionality that satisfy this limitation.

41. Claim 1 of the '360 Patent recites an "apparatus" comprising "a switching apparatus which is connected to the measuring device and the communication element and which switches on the communication element when it has received the control signal from the measuring device

by connecting the communication element to an energy source." The Accused Products include a switching apparatus which is connected to the measuring device and the communication element and which switches on the communication element when it has received the control signal from the measuring device by connecting the communication element to an energy source. For example, on information and belief, the Accused Products include low power modes for the NFC functionality that satisfy this limitation.

42. Apple also knowingly and intentionally induces infringement of one or more claims of the '360 Patent in violation of 35 U.S.C. § 271(b). As of at least the filing and service of this complaint, Apple has knowledge of the '360 Patent and the infringing nature of the Accused Products. Despite this knowledge of the '360 Patent, Apple continues to actively encourage and instruct its customers and end users (for example, through user manuals and online instruction materials on its website, and other online publications cited above) to use the Accused Products in ways that directly infringe the '360 Patent, for example by utilizing the NFC functionality on the Accused Products, in an infringing manner. Apple does so knowing and intending (or with willful blindness to the fact) that its customers and end users will commit these infringing acts. Apple also continues to make, use, offer for sale, sell, and/or import the Accused Products, despite its knowledge of the '360 Patent, thereby specifically intending for and inducing its customers to infringe the '360 Patent through the customers' normal and customary use of the Accused Products.

43. Apple has also infringed, and continues to infringe, one or more claims of the '360 Patent by selling, offering for sale, or importing into the United States, the Accused Products, knowing that the Accused Products constitute a material part of the inventions claimed in the '360 Patent, are especially made or adapted to infringe the '360 Patent, and are not staple articles or

commodities of commerce suitable for non-infringing use. Apple has been, and currently is, contributorily infringing the '360 Patent in violation of 35 U.S.C. §§ 271(c) and/or (f).

44. By making, using, offering for sale, selling and/or importing into the United States the Accused Products, Apple has injured Plaintiff and is liable for infringement of the '360 Patent pursuant to 35 U.S.C. § 271.

45. As a result of Apple's infringement of the '360 Patent, Plaintiff is entitled to monetary damages (past, present, and future) in an amount adequate to compensate for Apple's infringement, but in no event less than a reasonable royalty for the use made of the invention by Apple, together with interest and costs as fixed by the Court.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully requests that this Court enter:

a. A judgment in favor of Plaintiff that Apple has infringed, either literally and/or under the doctrine of equivalents, the '706, '249, and '360 Patents;

b. A judgment and order requiring Apple to pay Plaintiff its damages (past, present, and future), costs, expenses, and pre-judgment and post-judgment interest for Apple's infringement of the '706, '249, and '360 Patents;

c. A judgment and order requiring Apple to pay Plaintiff compulsory ongoing licensing fees, as determined by the Court in equity.

d. A judgment and order requiring Apple to provide an accounting and to pay supplemental damages to Plaintiff, including without limitation, pre-judgment and post-judgment interest and compensation for infringing products released after the filing of this case that are not colorably different from the accused products;

e. A judgment and order finding that this is an exceptional case within the meaning

of 35 U.S.C. § 285 and awarding to Plaintiff its reasonable attorneys' fees against Apple; and

f. Any and all other relief as the Court may deem appropriate and just under the circumstances.

DEMAND FOR JURY TRIAL

Plaintiff, under Rule 38 of the Federal Rules of Civil Procedure, requests a trial by jury of any issues so triable by right.

Dated: October 22, 2021

Respectfully submitted,

/s/Brett E. Cooper

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